

## PATENT SPECIFICATION



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## COMPLETE SPECIFICATION.

### Improvements in or relating to the Manufacture of Lacquers, Films, Plastic Masses and the like.

We, DEUTSCHE HYDRIERWERKE AK-  
TIENGESELLSCHAFT, a Joint Stock Com-  
pany organised under German Law, of  
Kantstrasse 163, Berlin-Charlottenburg,  
Germany, and of Rodleben, bei Rossau,  
Anhalt, Germany, do hereby declare the  
nature of this invention and in what  
manner the same is to be performed, to be  
particularly described and ascertained in  
and by the following statement:—

The present invention relates to im-  
provements in or relating to the manu-  
facture of lacquers, films, plastic masses  
and the like having cellulose ester bases.

The use of esters of organic dicarboxy-  
lic acids as softening and gelatinising  
agents for lacquers and plastic masses of  
cellulose esters is already known. Thus  
for this purpose hitherto adipic acid and  
phthalic acid esters have frequently been  
used which within certain limits exhibit  
satisfactory softening and gelatinising  
properties without however entirely satis-  
fying the requirements placed on such  
products. The action of softening and  
gelatinising agents in the film is not  
finally a question of the solvent proper-  
ties of these agents which impart homo-  
geneity and plasticity to the films, plastic  
masses or the like. These properties are  
however only present to a limited extent  
in the case of the known softening and  
gelatinising agents especially when it is  
a question of working up cellulose esters  
of the type of acetyl cellulose.

Now surprisingly in the esters of  
hydroxyl containing aliphatic polycar-  
boxylic acids and mono or polynuclear  
hydroaromatic alcohols a group of  
softening and gelatinising agents has  
been found which possess very good plas-  
ticising properties and above all are  
characterised by outstanding solvent  
powers so that they can be employed with  
great advantage for the preparation of  
lacquers, plastic masses and films of cellu-  
lose esters especially of acetyl cellulose.  
As alcoholic components of the esters, are  
to be considered the mono or polynuclear  
hydroaromatic alcohols such for example  
as the hydrogenated phenols, naphthols  
or also terpene-like alcohols whereby a  
certain variation in the properties of the

[Price 1s.]

esters only arises in so far as the esters  
with higher molecular alcohols possess a  
somewhat lower solvent power to make up  
for which however they impart to the pro-  
ducts produced with them a greater flexi-  
bility (fulness). Esters of the kind men-  
tioned are for example malic acid dicyclo-  
hexyl ester, tartaric acid dimethyl  
cyclohexyl ester, tartaric acid dideca-  
hydro- $\beta$ -naphthyl ester, malic acid di-  
menthyl ester, citric acid tricyclohexyl  
ester and the like.

The advantageous properties of the said  
esters as softening and gelatinising agents  
are probably also to be ascribed to the  
hydroxyl groups contained in the acid  
components which perhaps bring about an  
increase of the solvent power of these  
esters.

In order that the invention may be well  
understood the following examples will  
be given by way of illustration only.

## EXAMPLE 1.

50 parts of acetyl cellulose and 20 parts  
of tartaric acid dimethyl cyclohexyl ester  
are dissolved in 350 parts of lactic acid  
ethyl ester and 100 parts of toluene are  
added. After spreading and drying, the  
lacquer obtained gives an acetyl cellulose  
film of excellent homogeneity and high  
flexibility.

## EXAMPLE 2.

25 parts of acetyl cellulose with addi-  
tion of 12 parts of tartaric acid dideca-  
hydro- $\beta$ -naphthyl ester and 6 parts of tri-  
cresyl phosphate are dissolved in a sol-  
vent mixture of 120 parts of ethyl alcohol  
and 55 parts of acetone with addition of  
15 parts of toluene. After pouring out  
and evaporating off the solvent the pro-  
duct obtained gives an acetyl cellulose film  
of high elasticity and good resistance to  
atmospheric influences.

Having now particularly described and  
ascertained the nature of our said inven-  
tion and in what manner the same is to  
be performed, we declare that what we  
claim is:—

1. A method of manufacturing  
lacquers, films, plastic masses and the like  
from cellulose esters characterised by the  
use as softening, gelatinising and like  
agents of one or more esters of hydroxyl

- containing, aliphatic polycarboxylic acids and mono or polynuclear hydroaromatic alcohols with or without other softening or like agents.
- 5 2. A method as claimed in Claim 1 in which one or more of the following esters is/are employed: malic acid dicyclohexyl ester, tartaric acid dimethyl cyclohexyl ester, tartaric acid didecahydro- $\beta$ -naphthyl ester, malic acid dimethyl ester, citric acid tricyclohexyl ester. 25
- 10 3. A method of manufacturing lacquers, films plastic masses and the like from cellulose esters especially acetyl cellulose substantially as described. 30
- 15 4. Lacquers, films, plastic masses and the like having a base of cellulose esters and containing as softening, gelatinising and like agents one or more esters of hydroxyl containing aliphatic polycarboxylic acids and mono or polynuclear hydroaromatic alcohols.
5. Lacquers, films, plastic masses and the like as claimed in Claim 5 containing one or more of the following esters:— malic acid dicyclohexyl ester, tartaric acid dimethyl cyclohexyl ester, tartaric acid didecahydro- $\beta$ -naphthyl ester, malic acid dimethyl ester, citric acid tricyclohexyl ester.
6. Lacquers, films, plastic masses and the like having a cellulose ester base, substantially as described.
- Dated this 19th day of November, 1934.
- For the Applicants,  
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